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Cisco Nexus 1000V License Configuration Guide, Release 4.0(4)SV1(1)

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Preface

This preface describes the audience, organization, and conventions of the *Cisco Nexus 1000V License Configuration Guide, Release 4.0(4)SV1(1)*. It also lists related documentation and how to obtain it.

This chapter includes the following sections:

- [Audience, page iii](#)
- [Organization, page iii](#)
- [Document Conventions, page iv](#)
- [Obtaining Documentation and Submitting a Service Request, page v](#)

Audience

This publication is for experienced network administrators who configure and maintain Cisco Nexus 1000V software.

Organization

This guide is organized as follows:

Chapter and Title	Description
Chapter 1, “Overview”	Provides an overview of licensing for the Cisco Nexus 1000V.
Chapter 2, “Installing and Configuring Licenses”	Describes how to do the following: <ul style="list-style-type: none">• Obtain a license file and then install it on the VSM.• Transfer a license between VEMs.• Release a license from a VEM.• Enable and disable volatile licenses.• Uninstall a license.• Change the serial number/host ID in a license.
Chapter 3, “Licensing Terminology”	Defines license terminology.

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Document Conventions

This document uses the following conventions:



Note

Means reader *take note*. Notes contain helpful suggestions or references to material not covered in the manual.



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



Tip

Means *the following information will help you solve a problem*.

Command descriptions use these conventions:

Convention	Description
boldface font	Commands and keywords are in boldface.
<i>italic font</i>	Arguments for which you supply values are in italics.
[]	Elements in square brackets are optional.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Screen examples use these conventions:

screen font	Terminal sessions and information that the switch displays are in screen font.
boldface screen font	Information that you must enter is in boldface screen font.
<i>italic screen font</i>	Arguments for which you supply values are in italic screen font.
< >	Non-printing characters, such as passwords, are in angle brackets.
[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or number sign (#) at the beginning of a line of code indicates a comment line.

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Related Documentation

Cisco Nexus 1000V includes the following documents available on Cisco.com:

General Information

Cisco Nexus 1000V Release Notes, Release 4.0(4)SV1(1)

Cisco Nexus 1000V and VMware Compatibility Information, Release 4.0(4)SV1(1)

Install and Upgrade

Cisco Nexus 1000V Software Installation Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V Virtual Ethernet Module Software Installation Guide, Release 4.0(4)SV1(1)

Configuration Guides

Cisco Nexus 1000V License Configuration Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V Getting Started Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V Interface Configuration Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V Layer 2 Switching Configuration Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V Port Profile Configuration Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V Quality of Service Configuration Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V Security Configuration Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V System Management Configuration Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V High Availability and Redundancy Reference, Release 4.0(4)SV1(1)

Reference Guides

Cisco Nexus 1000V Command Reference, Release 4.0(4)SV1(1)

Cisco Nexus 1000V MIB Quick Reference

Troubleshooting and Alerts

Cisco Nexus 1000V Troubleshooting Guide, Release 4.0(4)SV1(1)

Cisco Nexus 1000V Password Recovery Guide

Cisco NX-OS System Messages Reference

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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CHAPTER 1

Overview

This chapter describes licensing for the Cisco Nexus 1000V software and includes the following sections:

- [Information About Cisco Nexus 1000V, page 1-1](#)
- [Licensing and High Availability, page 1-2](#)
- [Types of Licenses, page 1-3](#)
- [Volatile Licenses, page 1-4](#)

Information About Cisco Nexus 1000V

Cisco Nexus 1000V provides Layer 2 switching functions in a virtualized server environment. Cisco Nexus 1000V replaces virtual switches within ESX servers and allows users to configure and monitor the virtual switch using the Cisco NX-OS command-line interface (CLI). Cisco Nexus 1000V also gives you visibility into the networking components of the ESX servers and access to the virtual switches within the network.

Cisco Nexus 1000V manages a data center defined by the vCenter server. Each server in the data center is represented as a line card in Cisco Nexus 1000V and can be managed as if it were a line card in a physical Cisco switch.

Cisco Nexus 1000V has the following components:

- Virtual Ethernet module (VEM)-data plane

Each hypervisor is embedded with one VEM. The VEM is a lightweight software component that effectively replaces the virtual switch by performing the following functions:

- Advanced networking and security
- Switching between directly attached virtual machines
- Uplinking to the rest of the network



Note A license is required for every CPU on a VEM.

- Virtual supervisor module (VSM)-control plane

The VSM is a standalone, external, physical or virtual appliance that performs the following functions for the Cisco Nexus 1000V system (that is, the combination of the VSM itself and all VEMs that it controls):

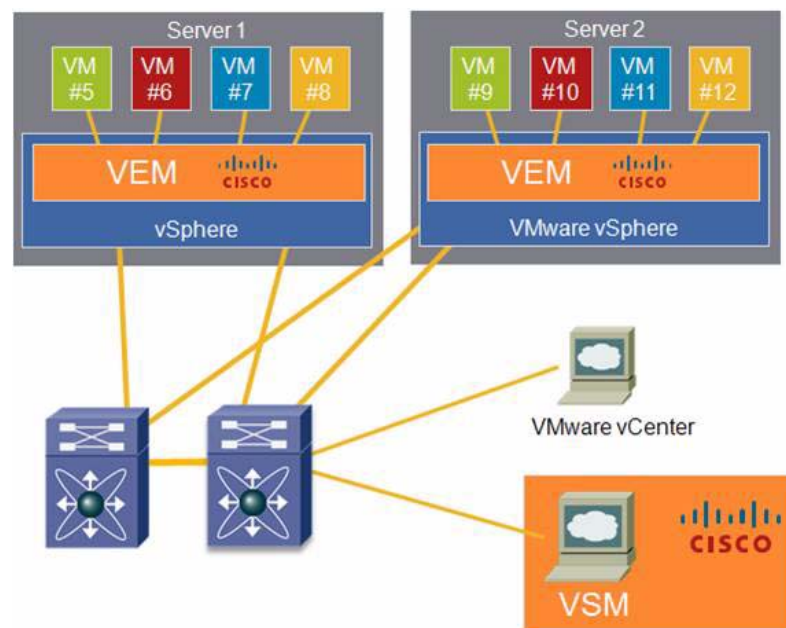
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- Configuration
- Management (A single VSM can manage up to 64 VEMs.)
- Monitoring
- Diagnostics
- Integration with VMware vCenter
- Licenses

The license is delivered in a Software License Claim Certificate in either e-mail or on paper.

Figure 1 shows an example of the Cisco Nexus 1000V distributed architecture. A Cisco Nexus 1000V license is needed for each installed server CPU.

Figure 1 Cisco Nexus 1000V Licenses are Based on Installed Server CPU



Licensing and High Availability

The following high-availability standards are applied to Cisco Nexus 1000V:

- Installing any license in the device is a nondisruptive process.
- If your system has dual supervisors, the licensed software runs on both supervisor modules and provides failover protection.

A Cisco Nexus 1000V license is required for each server CPU in your system. You purchase these licenses in a package and then install the package on your VSM. For more information, see [Chapter 2, “Installing and Configuring Licenses.”](#)

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Types of Licenses

This section includes the following topics:

- [Permanent Licenses, page 1-3](#)
- [Evaluation Licenses, page 1-3](#)
- [Overdraft Licenses, page 1-4](#)

Permanent Licenses

You can purchase permanent licenses for a fixed number of VEM CPU sockets. Permanent licenses do not expire. The number of licenses is specified in the license file purchased.

When you subsequently upgrade to a new software release, all previously installed permanent licenses remain in effect.

When you purchase permanent licenses, make sure to request enough licenses to cover all of your installed CPUs in all of your VEMs. Before licenses are applied to a VEM, enough licenses must be available to cover all of the CPUs in that VEM. If you are short by one CPU, then no licenses are applied to the VEM.



Note

If your license does not have the capacity to cover all CPUs in a particular VEM, then any licenses that could have been applied to that VEM are, instead, placed into a pool of available licenses on the VSM to be used as needed. The VEM remains unlicensed until sufficient licenses are available to cover all CPUs in the VEM.

After you purchase a license package, you then install the package on your VSM. [Table 1](#) shows an example of a license package name.

Table 1 License Package

License Package	Description
NEXUS1000V_LAN_SERVICES_PKG.	Virtual Ethernet Module (VEM)

For more information, see [Chapter 2, “Installing and Configuring Licenses.”](#)

After installing permanent licenses, if your evaluation licenses are no longer used, you can remove the evaluation license file from the pool. For more information, see the [“Uninstalling a License” section on page 2-7](#).

Evaluation Licenses

Evaluation licenses are available from Cisco.com in packages of 16 licenses that are valid for 60 days or until you upgrade to a new version of Cisco Nexus 1000V. Evaluation licenses let you evaluate the Cisco Nexus 1000V before purchasing permanent licenses.

The 60-day evaluation period starts when you install the evaluation license file. An evaluation license is not invalidated when you install a permanent license.

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Evaluation licenses are invalidated when one of the following occurs:

- The licenses reach their expiration date.
- You upgrade to a new version of Cisco Nexus 1000V.

When upgrading to a new software release, any previously installed evaluation licenses are invalidated, and the 16 default licenses included in the upgraded Cisco Nexus 1000V software are applied to your VEMs.

**Caution**

Service Disruption—If your evaluation licenses expire, your VEMs are unlicensed. The vEthernet interfaces on unlicensed VEMs are removed from service and the traffic flowing to them from virtual machines is dropped. This traffic flow is not resumed until you add a new license file.

After installing permanent licenses, if your evaluation licenses are no longer used, you can remove the evaluation license file from the pool. For more information, see the [“Uninstalling a License” section on page 2-7](#).

Overdraft Licenses

Overdraft licenses can prevent a service disruption in the event you exceed the number of permanent or evaluation licenses specified in your license file. The number of overdraft licenses provided is based on the number of licenses ordered.

Volatile Licenses

The volatile license feature automatically captures unused licenses when a VEM is taken out of service and adds them to the VSM license pool so that they can be reused by another VEM. When you enable this feature, any time a VEM is taken out of service, either automatically or manually, its licenses are returned to the VSM license pool.

In contrast, if its licenses are nonvolatile, then the VEM does not release them when taken out of service. When returned to service, the VEM resumes normal activity without further interruption.

The Volatile Licenses feature is disabled by default. That is, the licenses in VEMs are nonvolatile and are not released when a VEM is removed from service.

**Note**

Service Disruption—Volatile licenses are removed from a VEM during a loss in connectivity and are not returned to the VEM when connectivity resumes. We recommend that volatile licenses remain disabled (the default), and that you transfer unused licenses using the [“Transferring Licenses to the License Pool” procedure on page 2-6](#).

For more details, see [Chapter 2, “Installing and Configuring Licenses.”](#)



CHAPTER 2

Installing and Configuring Licenses

This chapter provides procedures for installing and configuring licenses and includes the following topics:

- [Information About Licenses, page 2-1](#)
- [Obtaining and Installing a License, page 2-1](#)
- [Transferring Licenses, page 2-5](#)
- [Uninstalling a License, page 2-7](#)
- [Configuring Volatile Licenses, page 2-9](#)
- [“Verifying the License Configuration” procedure on page 2-12](#)
- [Changing the Serial Number in a License, page 2-13](#)
- [Feature History for Licenses, page 2-16](#)

Information About Licenses

A Cisco Nexus 1000V license is required for each server CPU in your system. You purchase these licenses in a package and then install the package on your VSM. For more information, see [Chapter 1, “Overview.”](#)

Obtaining and Installing a License

This section describes how to obtain the license file that is required for each VSM and then install it. This section includes the following topics:

- [Flow Chart: Obtaining and Installing a License, page 2-2](#)
- [Obtaining the License File, page 2-2](#)
- [Installing the License File on the VSM, page 2-4](#)
- [Verifying the License Configuration, page 2-12](#)

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BEFORE YOU BEGIN

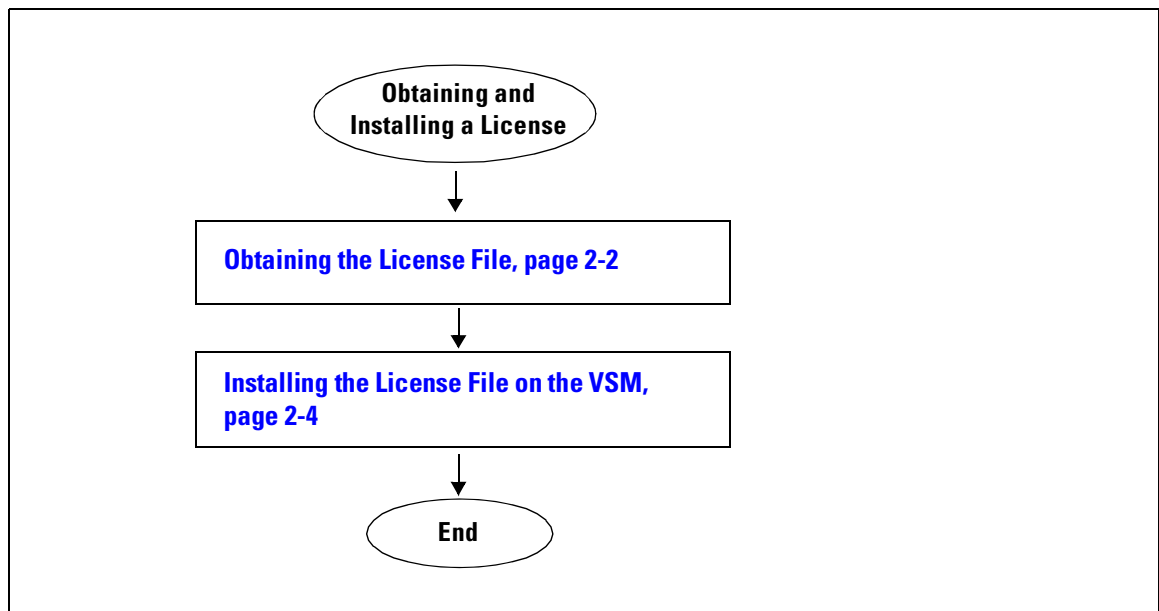
Before beginning the procedures in this section, you must know or do the following:

- A license file is tied to each VSM by the host ID, or the serial number associated with the VSM device.
- A license file contains the number of licenses ordered for your VSM. One license is required for each CPU on each VEM.
- A VSM can have more than one license file depending on the number of installed VEM CPUs.

Flow Chart: Obtaining and Installing a License

The following flow chart guides you through the process of installing a license on a VSM. After completing a procedure, return to the flow chart to make sure you complete all procedures in the correct sequence.

Figure 1 *Flow Chart: Obtaining and Installing a License*



Obtaining the License File

Use this procedure to obtain a license file for a VSM.

BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- A license file is tied to each VSM by the host ID, or the serial number associated with the VSM device.

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- Make sure that you have your product authorization key (PAK), found in your software license claim certificate.
If you cannot locate your software license claim certificate, contact [Cisco Technical Support](#).
- You are logged in to the CLI in EXEC mode.
- This procedure requires you to copy a license file. Your username must have the network-admin role which allows you to copy files. For information about user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide, Release 4.0(4)SV1(1)*.

DETAILED STEPS

Step 1 Using the following command, obtain the serial number, also called the host ID, for your VSM:

show license host-id

Example:

```
n1000v# show license host-id
License hostid: VDH=1280389551234985805
```



Note The host ID encompasses everything that appears after the equal sign (=). In this example, the host ID is 1280389551234985805. You will need the host ID in [Step 5](#).

Step 2 From your software license claim certificate, locate the product authorization key (PAK).

You will need the PAK in [Step 5](#).

Step 3 Go to the [Software Download web site](#).

Step 4 From the Software Download web site, go to the [Product License Registration web site](#).

Step 5 From the Product License Registration web site follow the instructions for registering your VSM license. The license key file is sent to you in e-mail. The license key authorizes use on only the host ID device. You must obtain separate license key file(s) for each of your VSMs.



Caution The license key file is invalidated if you modify it.

Step 6 Copy your license key file to bootflash on the VSM.

copy *[source url] filename [destination filesystem:] filename*

Example:

```
n1000v# copy scp://user@linux-box.cisco.com/home/user/nlkv_license.lic bootflash:
nlkv_license.lic
Enter vrf (If no input, current vrf 'default' is considered):
user@linux-box.cisco.com's password:
nlkv_license.lic                               100% 252      0.3KB/s   00:00

n1000v#
```

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Installing the License File on the VSM

Use this procedure to install the license file(s) on a VSM. Installing multiple licenses is called stacking.

BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- This procedure installs the license file using the name, `license_file.lic`. You can specify a different name.
- If you are installing multiple licenses for the same VSM, also called license stacking, make sure that each license key file name is unique.
- Repeat this procedure for each additional license file you are installing, or stacking, on the VSM.
- You must first uninstall an evaluation license if one is present on your VSM. See the [“Uninstalling a License” procedure on page 2-7](#).
- Make sure you are logged in to the active VSM console port.
- This procedure requires that your username is assigned the `network-admin` role. This role is required to install license files. For information about user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide, Release 4.0(4)SV1(1)*.

SUMMARY STEPS

- 1 **install license bootflash:** *file_name*
- 2 **show license file** *file_name*
- 3 **show license usage**
- 4 **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	install license bootflash: <i>[filename]</i> Example: <pre>n1000v# install license bootflash:license_file.lic Installing license ..done n1000v#</pre>	From the active VSM console, installs the license. Note If you specify a license file name, the file is installed with the specified name. Otherwise, the default filename is used. The license is installed on the VSM and each VEM automatically acquires a license for every CPU socket.
Step 2	show license file <i>file_name</i> Example: <pre>n1000v# show license file license.lic SERVER this_host ANY VENDOR cisco INCREMENT NEXUS1000V_LAN_SERVICES_PKG cisco 1.0 permanent 1 HOSTID=VDH=1575337335122974806 \ NOTICE="<LicFileID>license.lic</LicFileID><LicLineID>0</LicLineID> \ <PAK>PAK12345678</PAK>" SIGN=3AF5C2D26E1A n1000v#</pre>	Verify the license installation by displaying the license configured for the VSM.

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	Command	Purpose
Step 3	show license usage Example: n1000v# show license usage <pre> Feature Ins Lic Status Expiry Date Comments Count ----- NEXUS1000V_LAN_SERVICES_PKG Yes 16 In use 17 Aug 2009 - </pre> n1000v#	Verifies the license installation by displaying it in the license usage table.
Step 4	copy running-config startup-config Example: n1000v(config)# copy running-config startup-config	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Transferring Licenses

This chapter provides information about transferring licenses between VEMs and uninstalling a license. This chapter includes the following sections:

- [Transferring Licenses Between VEMs, page 2-5](#)
- [Transferring Licenses to the License Pool, page 2-6](#)

Transferring Licenses Between VEMs

Use this procedure to transfer licenses from one VEM to another, after moving a VM from one host to another.

BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- You have at least one active VEM in the VSM.
- You are logged in to the CLI in EXEC mode.
- You know the VEM you want to transfer licenses from and the number of licenses it has.
- You know the VEM you are transferring licenses to and the number of licenses required.
- You know the number of CPUs installed on the destination VEM.
- Licenses cannot be transferred to a VEM unless there are sufficient licenses in the pool for all CPUs on that VEM.
- When licenses are successfully transferred from one VEM to another, then the virtual Ethernet interfaces on the source VEM are removed from service, and the virtual Ethernet interfaces on the destination VEM are brought into service.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.0(4)SV1(1)*.

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SUMMARY STEPS

- 1 **svs license transfer src-vem <vem no> dst-vem <vem no>**
- 2 **show license usage package_name**

DETAILED STEPS

	Command	Purpose
Step 1	<pre>svs license transfer src-vem <vem no> dst-vem <vem no></pre> <p>Example:</p> <pre>n1000v# svs license transfer src-vem 3 dst-vem 5 n1000v(config)#</pre>	<p>Transfers the licenses from one VEM to another.</p> <p>In this example the licenses for VEM 3 are transferred to VEM 5.</p>
Step 2	<pre>show license usage package_name</pre> <p>Example:</p> <pre>n1000v# show license usage NEXUS1000V_LAN_SERVICES_PKG Application ----- VEM 5 - Socket 1 VEM 5 - Socket 2 VEM 4 - Socket 1 VEM 4 - Socket 2 ----- n1000v#</pre>	<p>Verifies the transfer by displaying the licenses in use on each VEM.</p> <p>In this example, VEM 5 now has the licenses previously used by VEM 3.</p>

Transferring Licenses to the License Pool

Use this procedure to transfer licenses from a VEM to the VSM license pool.

BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- You have at least one active VEM in the VSM.
- You are logged in to the CLI in EXEC mode.
- This procedure transfers licenses from a VEM to the VSM license pool.
- All of the virtual Ethernet interfaces on the VEM are removed from service when its licenses are transferred to the license pool.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.0(4)SV1(1)*.

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SUMMARY STEPS

- 1 `svs license transfer src-vem <vem no> license_pool`
- 2 `show license usage package_name`

DETAILED STEPS

	Command	Purpose
Step 1	<pre>svs license transfer src-vem <vem no> license_pool</pre> <p>Example: n1000v# svs license transfer src-vem 3 license_pool n1000v(config)#</p>	<p>Transfers the licenses from a VEM to the license pool.</p> <p>The licenses for this VEM are released back to the pool of available licenses on the VSM.</p>
Step 2	<pre>show license usage package_name</pre> <p>Example: n1000v# show license usage NEXUS1000V_LAN_SERVICES_PKG Application ----- VEM 4 - Socket 1 VEM 4 - Socket 2 ----- n1000v#</p>	<p>Verifies the transfer by displaying the licenses in use on each VEM.</p> <p>In this example, VEM 3 licenses are no longer in use.</p>

Uninstalling a License

Use this procedure to uninstall a license that is not in use or to uninstall an evaluation license before adding a permanent license.

BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:



Caution

Service Disruption

When you uninstall a license file from a VSM, the vEthernet interfaces on the VEMs are removed from service and the traffic flowing to them from virtual machines is dropped. This traffic flow is not resumed until you add a new license file with licenses for the VEMs. We recommend notifying the server administrator that you are uninstalling a license and this will cause the vEthernet interfaces to shut down.

- You have at least one active VEM in the VSM.
- You are logged in to the CLI in EXEC mode.
- If a license is in use, you cannot delete it. This procedure includes instructions for transferring all licenses from the VEMs to the VSM license pool before uninstalling the license file.

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- This procedure requires that your username have the network-admin role. The network-admin role is required to uninstall licenses. For information on user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide, Release 4.0(4)SV1(1)*.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.0(4)SV1(1)*.

SUMMARY STEPS

- 1 **copy running-config tftp://server/path/filename**
- 2 **show license brief**
- 3 **show license usage license_name**
- 4 **svs license transfer src-vem <vem no> license_pool**
- 5 Repeat [Step 4](#) for each VEM.
- 6 **clear license license_name**
- 7 **Yes**
- 8 **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	<pre>copy running-config tftp://server/path/filename</pre> <p>Example: n1000v# copy running-config tftp: n1000v(config)#</p>	Copies the VSM running configuration to a remote server.
Step 2	<pre>show license brief</pre> <p>Example: n1000v# show license brief Enterprise.lic n1000v#</p>	Identifies the name of the license file to uninstall. In this example, the file to uninstall is the Enterprise.lic file.
Step 3	<pre>show license usage package_name</pre> <p>Example: n1000v# show license usage NEXUS1000V_LAN_SERVICES_PKG Application ----- VEM 3 - Socket 1 VEM 3 - Socket 2 VEM 4 - Socket 1 VEM 4 - Socket 2 ----- n1000v#</p>	Displays the licenses in use on each VEM so that you can transfer them back to the VSM license pool before uninstalling the license file.

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	Command	Purpose
Step 4	<pre>svs license transfer src-vem <vem no> license_pool</pre> <p>Example: n1000v# svs license transfer src-vem 3 license_pool</p>	<p>Transfers the licenses from the VEM back to the VSM license pool.</p> <p>As the licenses are transferred from a VEM, its vEthernet interfaces are shut down and the following syslog is generated: PLATFORM-2-PFM_VEM_UNLICENSED</p>
Step 5	Repeat Step 4 for each VEM until all licenses in use have been transferred back to the VSM license pool.	
Step 6	<pre>clear license license_name</pre> <p>Example: n1000v# clear license Enterprise.lic Clearing license Enterprise.lic: SERVER this_host ANY VENDOR cisco Do you want to continue? (y/n) y Clearing license ..done</p>	<p>Begins the uninstall of the named license file.</p> <p>In this example, the Enterprise.lic file is uninstalled.</p>
Step 7	<pre>Yes</pre> <p>Example: Do you want to continue? (y/n) y Clearing license ..done</p>	<p>Continues and completes the uninstall of the named license file.</p> <p>The license file is uninstalled from the VSM.</p>
Step 8	<pre>copy running-config startup-config</pre> <p>Example: n1000v(config)# copy running-config startup-config</p>	<p>(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.</p>

Configuring Volatile Licenses

This chapter provides information about enabling and disabling the volatile license feature. This chapter includes the following sections:

- [Information about Volatile Licenses, page 2-9](#)
- [Enabling Volatile Licenses, page 2-10](#)
- [Disabling Volatile Licenses, page 2-11](#)

Information about Volatile Licenses

The volatile license feature automatically captures unused licenses when a VEM is taken out of service and adds them to the VSM license pool so that they can be reused by another VEM. When you enable this feature, then any time a VEM is taken out of service, either automatically or manually, its licenses are returned to the VSM license pool.

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In contrast, if its licenses are non-volatile, then the VEM does not release them during a loss in network connectivity with the VSM. When connectivity is returned, the VEM can resume normal activity without further interruption.

The Volatile Licenses feature is disabled by default. That is, the licenses in VEMs are non-volatile and are not released when a VEM is removed from service.



Caution

Service Disruption

Volatile licenses are removed from a VEM during a loss in connectivity and are not returned to the VEM when connectivity resumes. Cisco recommends the volatile licenses remain disabled (the default). Cisco recommends that you, instead, transfer unused licenses using the [“Transferring Licenses to the License Pool” procedure on page 2-6](#).

Enabling Volatile Licenses

Use this procedure to enable volatile licenses so that, whenever a VEM is taken out of service, its licenses are returned to the VSM pool of available licenses.



Caution

Service Disruption

Volatile licenses are removed from a VEM during a loss in connectivity and are not returned to the VEM when connectivity resumes. Cisco recommends the volatile licenses remain disabled and that you, instead, transfer unused licenses using the [“Transferring Licenses to the License Pool” procedure on page 2-6](#).

BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- You have at least one active VEM in the VSM.
- You are logged in to the CLI in EXEC mode.
- Volatile license is disabled by default. That is, by default, licenses are not returned to the VSM pool when a VEM is removed from service.

SUMMARY STEPS

- 1 **config t**
- 2 **svs license volatile**
- 3 **show**
- 4 **copy running-config startup-config**

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DETAILED STEPS

	Command	Purpose
Step 1	config t Example: n1000v# config t n1000v(config)#	Places you into CLI Global Configuration mode.
Step 2	svs license volatile Example: n1000v(config)# svs license volatile n1000v(config)#	Enables volatile licenses in the running configuration.
Step 3	copy running-config startup-config Example: n1000v(config)# copy running-config startup-config	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Disabling Volatile Licenses

Use this procedure to disable volatile licenses so that, when a VEM is taken out of service, its licenses are not returned to the VSM pool of available licenses.

BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- You have at least one active VEM in the VSM.
- You are logged in to the CLI in EXEC mode.
- Volatile license is disabled by default. That is, by default, licenses are not returned to the VSM pool when a VEM is removed from service.
- For detailed information about the fields in the output of these commands, see the *Cisco Nexus 1000V Command Reference, Release 4.0(4)SV1(1)*.

SUMMARY STEPS

- 1 **config t**
- 2 **no svs license volatile**
- 3 **show**
- 4 **copy running-config startup-config**

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DETAILED STEPS

	Command	Purpose
Step 1	<code>config t</code> Example: n1000v# config t n1000v(config)#	Places you into CLI Global Configuration mode.
Step 2	<code>no svs license volatile</code> Example: n1000v(config)# no svs license volatile n1000v(config)#	Disables volatile licenses in the running configuration.
Step 3	<code>copy running-config startup-config</code> Example: n1000v(config)# copy running-config startup-config	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Verifying the License Configuration

Use the commands in [Table 2-1](#) to verify licenses configured in your system:

Table 2-1 Verifying License Installation

Command	Description
<code>show license</code>	Displays the license configured for the VSM. See Example 2-1 on page 2-12 .
<code>show license brief</code>	Displays the license installed on the VSM. See Example 2-2 on page 2-13 .
<code>show license file filename</code>	Displays the license configured for the VSM. See Example 2-3 on page 2-13 .
<code>show license usage</code>	Displays the total CPU licenses in use on your VEMs. See Example 2-4 on page 2-13 .
<code>show license usage filename</code>	Displays the CPU licenses in use on each VEM. See Example 2-5 on page 2-13 .

Example 2-1 Show License

```
n1000v# show license
Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT LAN_ENTERPRISE_SERVICES_PKG cisco 1.0 permanent uncounted \
    VENDOR_STRING=<LIC_SOURCE>MDS_SWIFT</LIC_SOURCE><SKU>N7K-LAN1K9=</SKU> \
    HOSTID=VDH=TBC10412106 \
    NOTICE="<LicFileID>20071025133322456</LicFileID><LicLineID>1</LicLineID>
\
```


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```
<PAK>PAK12345678</PAK>" SIGN=0CC6E2245FBE
```

Example 2-2 Show License Brief

```
n1000v# show license brief
Enterprise.lic
```

Example 2-3 Show License File

```
n1000v# show license file n1kv_license.lic
Enterprise.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT LAN_ENTERPRISE_SERVICES_PKG cisco 1.0 permanent uncounted \
  VENDOR_STRING=<LIC_SOURCE>MDS_SWIFT</LIC_SOURCE><SKU>N7K-LAN1K9=</SKU> \
  HOSTID=VDH=TBC10412106 \
  NOTICE="<LicFileID>20071025133322456</LicFileID><LicLineID>1</LicLineID>
 \
<PAK>PAK12345678</PAK>" SIGN=0CC6E2245FBE
```

Example 2-4 Show License Usage

```
n1000v# show license usage
Feature                               Ins Lic      Status      Expiry      Date Comments
                                   Count
-----
NEXUS1000V_LAN_SERVICES_PKG          Yes 100      In use      Never        -
-----

n1000v#
```

Example 2-5 Show License Usage filename

```
n1000v# show license usage NEXUS1000V_LAN_SERVICES_PKG
Application
-----
VEM 3 - Socket 1
VEM 3 - Socket 2
VEM 4 - Socket 1
VEM 4 - Socket 2
-----

n1000v#
```

Changing the Serial Number in a License

Use this procedure to change the serial number, or host ID, associated with a license. This process is also called rehosting and is required if you replace a VSM in your network with a new VSM.

This section includes the following topics:

- [Flow Chart: Changing the Serial Number in a License, page 2-14](#)

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- [Obtaining the License File, page 2-2](#)
- [Installing the License File on the VSM, page 2-4](#)
- [Verifying the License Configuration, page 2-12](#)

BEFORE YOU BEGIN

Before beginning the procedures in this section, you must know or do the following:



Caution

Service Disruption

When you remove a VSM from your network, the vEthernet interfaces on the VEMs are removed from service and the traffic flowing to them from virtual machines is dropped. This traffic flow is not resumed until you add a new VSM and new license file with the new host ID.

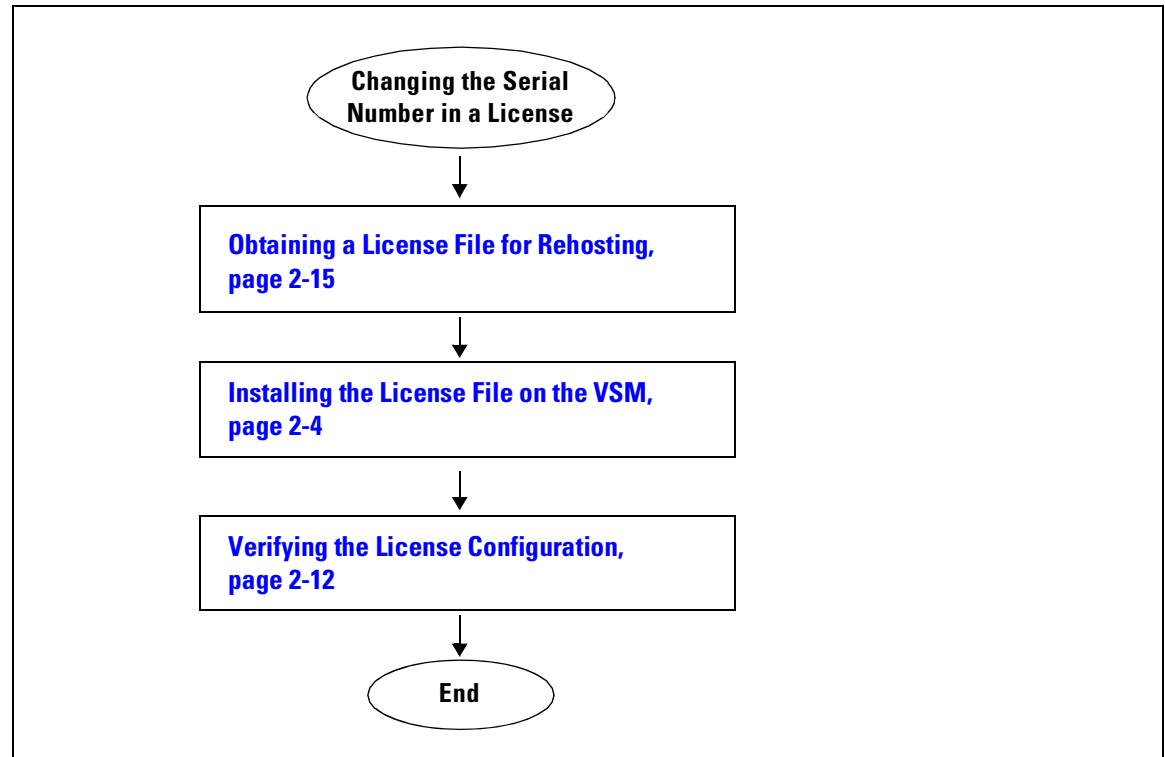
- You have a copy of your existing license file(s) with the host ID of the existing VSM.
- A license file is tied to each VSM by the host ID, or the serial number, associated with the VSM device.
- A license file contains the number of licenses ordered for your VSM. One license is required for each CPU on each VEM.
- A VSM can have more than one license file depending on the number of installed VEM CPUs.
- If you have multiple license files stacked on your VSM, repeat this process for each license file.

Flow Chart: Changing the Serial Number in a License

The following flow chart guides you through the process required to change the serial number, or host ID, in an existing license. After completing a procedure, return to the flow chart to make sure you complete all procedures in the correct sequence.

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Figure 2 Flow Chart: Changing the Serial Number in a License



Obtaining a License File for Rehosting

Use this procedure to obtain a new license file when you are changing the VSM host, also called rehosting.

BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- A license file is tied to each VSM by the host ID, or the VSM serial number.
- You are logged in to the CLI in EXEC mode.
- This procedure requires you to copy a license file. Your username must have the network-admin role which allows you to copy files. For information about user accounts and roles, see the *Cisco Nexus 1000V Security Configuration Guide, Release 4.0(4)SV1(1)*.

DETAILED STEPS

- Step 1** Using the following command, obtain the serial number, also called the host ID, for your new VSM:
- show license host-id**

Example:

```
n1000v# show license host-id
License hostid: VDH=1280389551234985805
```

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Note The host ID encompasses everything that appears after the equal sign (=). In this example, the host ID is 1280389551234985805. You will need the host ID in [Step 5](#).

- Step 2** E-mail the following information to licensing@cisco.com, requesting the license file be rehosted to the new host ID:
- the new host ID
 - a copy of the existing license file from the old VSM

A new license key file, with the host ID of the new VSM, is sent to you in E-mail within 48 hours.



Caution The license key file is invalidated if you modify it.

Step 3 Save your license to a TFTP server.

Step 4 Copy your license to bootflash on the VSM.

Example:

```
n1000v@ copy scp://user@linux-box.cisco.com/home/user/n1kv_license.lic bootflash:
Enter vrf (If no input, current vrf 'default' is considered):
user@linux-box.cisco.com's password:
n1kv_license.lic                               100% 252      0.3KB/s   00:00
n1000v@
```

Feature History for Licenses

This section provides the license release history.

Feature Name	Releases	Feature Information
Licenses	4.0	This feature was introduced.



CHAPTER 3

Licensing Terminology

Table 3-1 describes the terminology used in Cisco Nexus 1000V licensing.

Table 3-1 *Licensing Terminology*

Term	Definition
Evaluation license	A temporary license. Evaluation licenses are valid for a specified number of days and are tied to a host ID (device serial number).
Host ID	A unique chassis serial number that is specific to each device.
Incremental license	A license for additional CPU sockets that were not included in the initial license file. License keys are incremental—if you purchase some CPU sockets now and others later, the license file and the software detect the sum of all sockets for the specified device.
License enforcement	A mechanism that prevents a feature from being used without first obtaining a license.
License key file	A file that specifies the total licensed CPU sockets for your system. Each file is uniquely named and is specific to a VSM. The file contains digital signatures to prevent tampering and modification. License keys are required to use the product and are enforced within a specified time span.
Licensed application	A software application or component that requires a license to be used.
Licensed feature	Permission to use a particular feature through a license file, a hardware object, or a legal contract. This permission is limited to the number of users, number of instances, time span, and the implemented device.
Missing license	If the bootflash has been corrupted or a supervisor module replaced after you have installed a license, that license shows as “missing.” The product still works. You should reinstall the license as soon as possible.
Node locked license	A license that can only be used on a particular device using the unique host ID for the device.
Permanent license	A license that is not time bound is called a permanent license.

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Table 3-1 **Licensing Terminology (continued)**

Term	Definition
Product Authorization Key (PAK)	A unique code, provided in the software license claim certificate, that allows you to obtain a license key. You use this key at a web site to register for your license. After you register, your license key file and installation instructions are sent to you in e mail.
Rehosting	The process of changing a license to reflect a different device serial number, or host ID. A host ID is unique to each device, for example VSM.
Software license claim certificate	A document entitling its rightful owner to use licensed features on one device as described in that document. This document provides the product authorization key (PAK).
Support	If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support .
Stacking	The process of adding multiple license files on a single VSM.
Volatile licenses	<p>A feature that automatically captures unused licenses when a VEM is taken out of service and adds them to the VSM license pool so that they can be reused by another VEM.</p> <p>In contrast, if its licenses are non-volatile, then the VEM does not release them during a loss in network connectivity with the VSM. When connectivity is returned, the VEM can resume normal activity without further interruption.</p> <p>Volatile Licenses are disabled by default. That is, the licenses in VEMs are non-volatile and are not released when a VEM is removed from service.</p>



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